

CardioPump®

ACD CPR is recommended in the American Heart Association Guidelines as an alternative to conventional standard manual CPR.

Active Compression Decompression (ACD) CPR



Performing ACD CPR with the CardioPump and ResQPOD®

The **CardioPump** permits the rescuer to actively re-expand the chest during the decompression phase of cardiopulmonary resuscitation (CPR). Active compression decompression CPR (ACD CPR) enhances the intrathoracic vacuum (negative pressure) during chest wall recoil, resulting in more blood being returned to the heart (preload). Enhanced preload leads to increased cardiac output on the subsequent chest compression.

The design of the device allows the rescuer to use the same position and compression technique as for standard CPR. The suction cup sticks to the chest and transfers a lifting force to the thorax. Active chest decompression is obtained simply when the operator swings their body weight upwards after each compression while holding on to the CardioPump's handle. Chest compression is accomplished in the same manner as for standard manual CPR by pushing down on the CardioPump.

When ACD CPR is performed in conjunction with the ResQPOD Impedance Threshold Device (ITD), hemodynamics are further improved.

In-hospital and out-of-hospital studies* have shown that performing ACD CPR:

- Increases arterial blood pressure
- Increases coronary perfusion pressure
- Lowers intrathoracic pressure during the decompression phase of CPR
- Increases short-term and long-term survival rates



Compression

Decompression

The CardioPump is indicated for use in the treatment of adult patients with out-of-hospital cardiac arrest (absence of effective pulse and respiration) to improve the overall efficiency of cardiopulmonary resuscitation (CPR) and the chances for short and long-term survival. It is intended to be used as an adjunct to locally recommended protocols for basic cardiac life support.



Manufactured by:

CardioPump®



ADVANCED CIRCULATORY SYSTEMS, INC.

www.advancedcirculatory.com

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Active Compression Decompression
(ACD) CPR

Technical Specifications

Dimensions

Suction cup: 135 mm OD
Handle: 143 x 108 mm

Weight: 0.58 kg (1.24 lbs)

Gauge range:

Compression: 0-50 kg (0-110 lbs)
Decompression: 0-15 kg (0-33 lbs)
Accuracy: ± 10% of reading
Operating temperature range: -20° C to 50° C
Storage temperature range: -40° C to 70° C

Metronome Function

Signal pitches: 768 and 3070 Hz
Sound level: 65 dB at 0.5 m from the sound source

Signal rate: 80 signals per minute

Battery life: Approx. 250 service hours

Battery shelf life: Approx. 10 years

Materials

Suction cup: Silicone rubber
Handle: Polyamide (nylon), glass fiber reinforced
Metal parts: Stainless steel, brass

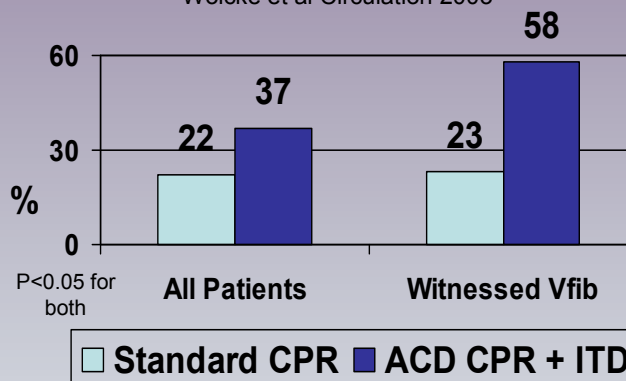
The CardioPump does not contain latex.

CardioPump Components:

- **Suction Cup** – provides the suction necessary to actively lift the chest during decompression. A compression pad located inside helps cushion the surface between the chest and the device.
- **Handle** – transfers force from the rescuer to the victim through the piston
- **Force Gauge** – guides both compression and decompression forces
- **Metronome** – guides proper compression/decompression rate and duty cycle

Survival to 24 Hours

Wolcke et al Circulation 2003



* References for ACD CPR:

1. Shultz JJ, et al. Evaluation of standard and ACD CPR in an acute human model of ventricular fibrillation. *Circulation* 1994; 89:684-94.
2. Lurie KG, et al. Evaluation of ACD CPR in victims of out-of-hospital cardiac arrest. *JAMA* 1994; 271:1405-11.
3. Plaisance P, et al. A comparison of standard CPR and ACD resuscitation for out-of-hospital cardiac arrest. *NEJM* 1999;341:569-75.
4. Plaisance P, et al. Benefit of ACD CPR as a prehospital advanced life support. A randomized multi-center study. *Circulation* 1997;95(4):955-61.
5. Mauer DK, et al. Effect of ACD CPR on survival: a combined analysis using individual patient data. *Resuscitation* 1999;41:249-56.

ACD CPR with an impedance threshold device (ITD) (e.g. ResQPOD®):

6. Wolcke BB, et al. Comparison of standard CPR versus the combination of ACD CPR and an ITD for out-of-hospital cardiac arrest. *Circulation* 2003;108(18):2201-5.
7. Plaisance P, et al. Inspiratory impedance during ACD CPR: a randomized evaluation in patients in cardiac arrest. *Circulation* 2000;101(9):989-94.
8. Plaisance P, et al. Evaluation of an ITD in patients receiving ACD CPR for out of hospital cardiac arrest. *Resuscitation* 2004;61(3):265-71.
9. Plaisance P, et al. Use of an inspiratory ITD on a facemask and ET tube to reduce intrathoracic pressures during the decompression phase of ACD CPR. *Crit Care Med* 2005;33(5):990-4.



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